No. XXII. — ILLUSTRATION OF THE CONSERVATION OF ENERGY.

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In the Proceedings of the American Academy, Dec. 11, 1878, can be found a preliminary paper by Mr. W. N. Hill and myself upon the heat developed by the rapid magnetization and demagnetization of iron. The research is still in progress, and we hope to determine how much of the work employed in driving dynamo-electric machines is consumed in heating the iron cores of the generator of electrical currents, and whether this loss of work should turn our attention to forms of generators in which this loss is obviated. It may well be that this loss is not sufficient to counterbalance decided advantages in the present form of such machines.

From my work in this research, I draw the following illustration of the conservation of energy.

Let an induction coil be set in action. In the circuit of the secondary coil place another coil of fine wire. Adjust the terminals of the induction coil so that the spark just passes: then place a core of iron or a bundle of iron wire in the coil which has been included in the secondary circuit. The spark instantly ceases to jump. A portion of the energy of the current in the secondary circuit has been consumed in magnetizing and demagnetizing the iron introduced into the additional coil. The work done in this way is capable of being measured.

It is also evident, that, when a number of telephones are in the same circuit, a part of the energy of the human voice is consumed at each telephone in heating the magnetic cores.